

REMARKS

Status Of Application

Claims 1-14 were pending as of the present Office Action, which sets forth that:

Claims 5-14 are withdrawn from consideration;

Claims 1-4 are objected to because of informalities;

Claims 2 and 4 are rejected under the second paragraph of 35 U.S.C. § 112; and

Claims 1-4 are rejected under 35 U.S.C. § 103(a) over prior art set forth on pages 1-9 of the specification in view of U.S. Patent 4,424,727 to Mader ("Mader").

By this Amendment, claims 5-14 have been cancelled.

Specification

The indication, in the Office Action, that the specification should be reviewed and revised for clarity is noted. It is respectfully requested that this requirement be held in abeyance, in accordance with 37 CFR § 1.111(b), until allowable subject matter is indicated.

Claim Objections

The objection to claims 1-4 due to various informalities requiring correction has been noted and appropriate correction has been made by claim amendment herein. Accordingly, it is respectfully requested that the objection to claims 1-4 be reconsidered and withdrawn.

35 U.S.C. § 112 Rejection

The rejection of claims 2 and 4 under the second paragraph of 35 U.S.C. § 112 is respectfully traversed as being no longer applicable since both claims 2 and 4, each as

amended, no longer recites the term “previously”. Therefore, it is respectfully requested that the rejection of claims 2 and 4 under the second paragraph of 35 U.S.C. § 112 be reconsidered and withdrawn.

35 U.S.C. § 103(a) Rejection

The rejection of claims 1-4 under 35 U.S.C. § 103(a) over prior art set forth on pages 1-9 of the specification in view of Mader is respectfully traversed based on the following.

The prior art set forth in the specification includes a discussion of manufacturing a gutter-shaped material having a flat middle surface and curved end surfaces (Figs. 1a-1c). Each of these three sections is pressed by a respective pair of dies 112 and 122, 113 and 123, and 111 and 121. Fig. 1b shows the square-u cross-section created by the pair of dies 113 and 123, and Fig. 1c shows the curved-u cross-section created by the pairs of dies 112 and 122, and 111 and 121. In a later step, as shown in Fig. 9b and 9c, the upwardly-extending walls of the square-u and curved-u cross-sections will be further bent to make a hollow shaft.

Mader is directed to a method of making a curved-u shaped metal reflector using a metal stamping tool. The metal stamping tool (Mader, Fig. 7) includes a mandrel section 28, two side stamping sections 32 and 34, and a hammer section 30. The process of making the metal reflector involves pressing reflector between the hammer section 30 and the mandrel section 28, then between each of the side stamping sections 32 and 34 and the hammer section 30.¹ If the resulting metal reflector is not the desired shape, the radius of the stamping tool is changed.²

Considering the discussions of the prior art in the specification and of Mader, absent the benefit of hindsight, it is unclear why one skilled in the art would be motivated to modify any of the devices discussed in the prior art in the specification in view of

¹ see Mader, col. 9, lines 27-35.

² see *id.* at col. 10, lines 3-27.

Mader. The metal stamping tool discussed in Mader is perhaps reminiscent of one of the pair of dies that forms the shape shown in Fig. 1c of the specification, however, the degree of precision the Mader process is directed towards would not likely be desirable in the process discussed in the prior art in the specification since the shape shown in Fig. 1c will be further bent in a later step. In addition, the method of adjusting for spring back taught by Mader which involves changing the radius of the stamping tool would coincide in the specification to changing the width of the upper dies 111(112) shown in Fig. 1c, rather than changing an angle or adding an inclination between pressing surfaces as set forth in amended claims 1-4.

Therefore, not only is there insufficient motivation for one skilled in the art to consider the proposed combination of the prior art set forth in the specification and Mader, but the proposed combination fails to disclose or suggest all of the limitations of claims 1-4. As a consequence, the proposed combination of the prior art set forth in the specification and Mader cannot render obvious claims 1-4, respectively.

Accordingly, it is respectfully requested that the rejection of claims 1-4 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

New Claims

New claims 15-21 have been added to provide a more adequate basis for protection of the invention.

Claim 15 recites *inter alia*:

prior to the step of pressing, forming pressing surfaces of the first and second pairs of dies such that a cross-section of the pairs of dies corresponding to said cross-section of the pressed workpiece includes a predetermined angle between sections of the pressing surfaces corresponding to the parallel sections of the pressed workpiece making said corresponding sections of pressing surfaces non-parallel.

and claim 19 recites *inter alia*:

prior to the step of pressing, forming pressing surfaces of the outer pairs of dies such that a cross-section of the outer pairs of dies corresponding to said cross-section of the pressed workpiece includes an angle between sections of the pressing surfaces corresponding to the parallel sections of the pressed workpiece making said corresponding sections of pressing surfaces of the outer dies non-parallel.

As discussed above, not only is there insufficient motivation for one skilled in the art to consider the proposed combination of the prior art set forth in the specification and Mader, but the proposed combination fails to disclose or suggest changing an angle or adding an inclination between pressing surfaces of pairs of dies. As a consequence, the proposed combination of the prior art set forth in the specification and Mader cannot render obvious claim 15, or claims 16-18 which depend from claim 15, or claim 19, or claims 20 or 21 which depend from claim 19.

CONCLUSION

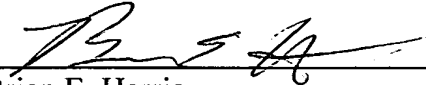
In view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

The following is a marked-up version of the changes that are being made in the attached response to the Office Action dated November 8, 2002.

IN THE CLAIMS:

Claims 5-14 have been cancelled.

New claims 15-21 have been added.

1. (Once Amended) A method for manufacturing a hollow rack shaft comprising:

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece, said gutter-like shaped workpiece ~~has~~ having a flat bottom portion, a pair of semi-circular bottom ~~portion~~ portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side ~~wall~~ walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a pressing surface of a ~~die set~~ pair of dies used in said first step is inclined in a longitudinal direction of said workpiece relative to a pressing surface of a second pair of dies used in said first step so as to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.

2. (Once Amended) A method for manufacturing a hollow rack shaft comprising:

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece; said gutter-like shaped workpiece ~~has~~ having a flat bottom portion, a pair of semi-circular bottom ~~portion~~ portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side ~~wall~~ walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a die set used in said second step provides a complementary surface to a row of rack teeth formed on said flat bottom portion and said ~~surface previously provides a shape~~ die set includes a first pair of dies and a second pair of dies having a difference in pressing angle suitable to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.

3. (Once Amended) A die set used in a method for manufacturing a hollow rack shaft, said method comprising;

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece; said gutter-like shaped workpiece ~~has~~ having a flat bottom portion, a pair of semi-circular bottom portion extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side ~~wall~~ walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein; a die set used in said second step provides a complementary surface to said semi-circular bottom portion and a pressing surface of ~~said die set~~ a pair of dies is inclined in a longitudinal direction of said workpiece relative to a pressing surface of a

second pair of dies used in said first step so as to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.

4. (Once Amended) A die set used in a method for manufacturing a hollow rack shaft, said method comprising;

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece; said gutter-like shaped workpiece ~~has~~ having a flat bottom portion, a pair of semi-circular bottom ~~portion~~ portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side ~~wall~~ walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a die set used in said second step provides a complementary surface to a row of rack teeth formed on said flat bottom portion and said ~~surface previously provides a shape~~ die set includes a first pair of dies and a second pair of dies having a difference in pressing angle suitable to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.